

## CLAIMS

*Sub Obj*

1. A transmitting apparatus comprising:

a memory for temporarily writing digital audio signals inputted thereto and for repeatedly implementing time axis compression processing every unit time period to the written digital audio signals to write and read them for a second time;

a modulation circuit for implementing modulation to the digital audio signal which has been read out from the memory; and

an infrared light emitting element for converting a modulated signal outputted from the modulation circuit into infrared rays to output them.

2. A transmitting apparatus as set forth in claim 1,  
wherein data for demodulating an audio signal that a headphone device affixed to a listener designated in advance receives and is added to a signal delivered to the modulation circuit.

3. A transmitting apparatus as set forth in claim 1,  
which comprises a channel converting circuit for converting audio signals which are caused to be audio signals of multi-channel structure into digital audio signals of 2 channels where sound image is localized at a predetermined position of listener to output them, and a sound field converting circuit for implementing, on the basis of head portion transfer function from two electroacoustic conversion units up to both

ears of the listener, signal processing to the digital audio signals of 2 channels to which channel conversion processing has been implemented by the channel converting circuit.

4. A transmitting apparatus as set forth in claim 1,

wherein data for permitting demodulation of an audio signal that a headphone device of listener designated in advance identifies and receives is added to a signal delivered to the modulation circuit.

5. A reproducing apparatus provided with a headphone device comprising a memory for temporarily writing digital audio signals inputted thereto to repeatedly implement time axis compression processing every unit time period to the written digital audio signals to write and read them for a second time, a modulation circuit for carrying out modulation of the digital audio signal which has been read out from the memory, and an infrared light emitting element for converting a modulated signal outputted from the modulation circuit into infrared rays to output them,

the reproducing apparatus comprising:

a light receiving element for receiving the infrared rays;

a demodulation circuit for demodulating the modulated signal outputted from the light receiving element to output signal to which the time axis compression processing has been implemented;

a memory adapted so that the signals every unit time period are repeatedly outputted from the demodulation circuit, signals equivalent to modulated input signal are written, and time axis expansion is implemented to the written signals so that they are written and read;

a D/A converter circuit for allowing the digital audio signal which has been read out from the memory to undergo D/A conversion to output an analog audio signal; and  
an electroacoustic converting unit supplied with the analog audio signal outputted from the D/A converter circuit.

6. A reproducing apparatus provided with a headphone device as set forth in claim 5,

wherein data for designating headphone device is added to a digital audio signal outputted from the demodulation circuit, and reception of signal can be made only in the case where the data is in correspondence with a designated select condition.

7. A reproducing apparatus provided with a headphone device as set forth in claim 5,

wherein digital audio signals outputted from the demodulation circuit are caused to be audio input signals of multi-channel structure, the audio input signals of the multi-channel structure are converted into audio signals of 2 channels in which sound image is localized at a predetermined position, signal processing is carried out on the

basis of head portion transfer function from two electroacoustic conversion units up to both ears of listener, and digital audio signal is caused to be digital audio signal which has been caused to undergo time axis compression,

the reproducing apparatus further comprising: a time difference addition circuit for adding time difference with respect to audio signals delivered to the electroacoustic conversion units; a level difference addition circuit for providing adding level difference with respect to audio signal delivered to the electroacoustic conversion units; and detecting means for detecting direction of head of the listener to control the time difference and the level difference in correspondence with direction of the head of the listener by a detection signal of the detecting means.

8. A reproducing apparatus provided with a headphone device as set forth in claim 7,

wherein data for designating headphone device is added to a digital audio signal outputted from the demodulation circuit, and reception of signal can be made only in the case where the data is in correspondence with a designated select condition.

9. A transmitting apparatus comprising:

a memory adapted to temporarily write digital audio signals inputted thereto to repeatedly implement time axis compression processing, every unit time period, to the digital audio signals thus written to write and read them for a second time;

a compression circuit for implementing compression to the digital audio signal which has been read out from the memory;

a modulation circuit for carrying out modulation of the compressed digital audio signal; and

an infrared light emitting element for converting a modulated signal outputted from the modulation circuit into infrared rays to output them.

10. A transmitting apparatus as set forth in claim 9,

wherein data for demodulating an audio signal that a headphone device affixed onto listener designated in advance receives and identifies is added to a signal delivered to the modulation circuit.

11. A transmitting apparatus as set forth in claim 9 comprising: a channel converting circuit for converting audio signals which are caused to be audio signals of multi-channel structure into audio signals of 2 channels in which sound image is localized at a predetermined position of listener to output them; and a sound field converting circuit for implementing, on the basis of head portion transfer function from two electroacoustic conversion units up to both ears of the listener, signal processing to audio signals of 2 channels to which channel conversion processing has been implemented by the channel converting circuit.

12. A transmitting apparatus as set forth in claim 11,

wherein data for permitting demodulation of an audio signal that a headphone device of listener designated in advance discriminates identifies and receives is added to a signal delivered to the modulation circuit.

13. A reproducing apparatus provided with a headphone device comprising: a memory adapted to temporarily write digital audio signals inputted thereto to repeatedly implement time axis compression processing, every unit time period, to the digital audio signals thus written to write and read them for a second time; a modulation circuit for carrying out modulation of the digital audio signal which has been read out from the memory; and an infrared light emitting element for converting a modulated signal outputted from the modulation circuit into infrared rays to output them,

the reproducing apparatus comprising:

a light receiving element for receiving the infrared rays;

a demodulation circuit for demodulating the modulated signal outputted from the light receiving element to output a compressed digital audio signal;

an expansion circuit for implementing expansion processing to the compressed digital audio signal to restore it into a digital audio signal which has not been caused to undergo compression processing;

a memory for allowing the digital audio signal outputted from the expansion

circuit to be repetitive signals to which time axis compression has been implemented every the unit time period to write signals of unit time period, and to implement thereto time axis expansion processing and defect correction processing of unit time period to carry out write and read operations thereof;

a D/A converter circuit for allowing the digital audio signal which has been read out from the memory to undergo D/A conversion to output an analog audio signal; and

an electroacoustic conversion unit supplied with the analog audio signal outputted from the D/A converter.

14. A reproducing apparatus provided with a headphone device as set forth in claim 13,

wherein data for designating headphone device is added to the digital audio signal outputted from the demodulation circuit, and reception of signal can be made only in the case where the data is in correspondence with a designated select condition.

15. A reproducing apparatus provided with a headphone device as set forth in claim 13,

wherein digital audio signals outputted from the demodulation circuit are caused to be audio input signals of multi-channel structure, the audio input signals of the multi-channel structure are converted into audio signals of 2-channels in which sound image is localized at a predetermined position of listener, signal processing is carried

out on the basis of head portion transfer function from two electroacoustic conversion units up to both ears of the listener, the digital audio signal is caused to be the time-axis compressed digital audio signal,

the reproducing apparatus further comprising: a time difference addition circuit for providing time difference with respect to audio signals delivered to the electroacoustic conversion units; a level difference addition circuit for providing level difference with respect to the audio signals delivered to the electroacoustic conversion units; and detecting means for detecting direction of head of the listener to control the time difference and the level difference in correspondence with direction of the head of the listener by a detection signal of the detecting means.

16. A reproducing apparatus provided with a headphone device as set forth in claim 15,

wherein data for designating headphone device is added to the digital audio signal outputted from the demodulation circuit, and reception of signal can be made only in the case where the data is in correspondence with a designated select condition.